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TITLE: Crozer-Chester Medical Center Burn Research Project

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14. ABSTRACT

The purpose of the research is to conduct burn research that will benefit combat casualties in the current conflict. The Nathan Speare Regional Burn Treatment Center is under contract with the U.S. Army Institute for Surgical Research and the Army Burn Center to carry out two studies according to protocols established by Army researchers. The purpose of Study 1, Automated Fluid Resuscitation of Burn Patients, is to collect data which will be used to create an effective resuscitation algorithm for the development of a closed loop resuscitation system. Approximately 20 patients will be enrolled in the Crozer Burn Treatment Center. Study 2, Evaluation of Aquacel Ag, will compare the performance of Aquacel Ag to the normal standard of care (Xeroform). Approximately 20 patients will be enrolled. A third study, A Comparison of Clinical and Microbiological Efficacy of Three Separate Antibiotic Regimens Against Acinetobacter baumannii, has been designed by the Principal Investigator and will be carried out at Crozer only.

During the past year, Crozer and the Army finalized the CRADA required to move forward with Study 1 and purchased all clinical equipment. Study 2 is continuing to enroll patients. To date 10 patients have completed the study. Study 3 has had no patients that meet criteria for enrollment to date.

15. SUBJECT TERMS
Automated fluid resuscitation devices, Closed-Loop algorithms, Kramer resuscitation; Aquacel Ag Dressing, Donor site care; Acinetobacter baumannii;

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Crozer-Chester Medical Center Nathan Speare Regional Burn Treatment Center

ANNUAL REPORT TO THE U.S. ARMY INSTITUTE OF SURGICAL RESEARCH FOR THE PERIOD 6/19/200 to 6/18/2010 (Year 3)

Title: "Crozer-Chester Medical Center Burn Research Projects"

Contract Number: W81XWH-07-1-0311, as amended

INTRODUCTION:

The purpose of the proposed project is to conduct burn research that will benefit combat casualties in the current conflict. The Army Burn Center, which is part of the Brooke Army Medical Center in Fort Sam Houston, Texas, has demonstrated the applicability of burn research in civilian populations to combat populations. The Nathan Speare Regional Burn Treatment Center is under contract with the U. S. Army Institute for Surgical Research to carry out two projects according to protocols that have been already established by Army researchers. A third project has been defined by Crozer's Principal Investigator. These projects are:

Study 1: "Automated Fluid Resuscitation of Burn Patients"
The purpose of Study 1 is to collect data which will be used to create an effective resuscitation algorithm for the development of a closed loop resuscitation system. The actual use of the closed loop resuscitation system will occur in a future study. Approximately 20 patients will be enrolled. The projects are expected to improve resuscitation of burn patients by creating a feedback loop of actual patient response to resuscitation volumes, and titrating the fluid therapy to changes in urinary output. Data from urometers, cardiac monitors and IV pumps will be measured at 10-minute intervals and fed to a DAQ, which is a computer system designed to collect data from this equipment at the bedside.

Study 2: "Evaluation of Xxx Dressing for Autogenous Skin Donor Sites"
This study will compare the performance of an agreed upon dressing to the normal standard of care (Xeroform). Patients who are scheduled for excision of burns or other injuries will have one of two donor sites covered with the Xxx dressing, and the other treated according to standard care. Approximately 30 patients will be enrolled. The hypothesis is that mean healing time for wounds treated with Xxx dressing will be less than the mean healing time for wounds treated with Xeroform dressing. Specific aims are: 1) that pain as perceived by the patient will be equal to or less than with the Xxx dressing as compared with the standard dressing, and 2) the cosmetic effect of healing at post surgery day 30-45 will be equal or less with the Xxx dressing as compared with the standard of care dressing.

Study 3: A Comparison of Clinical and Microbiological Efficacy of Three Separate Antibiotic Regimens Against *Acinetobacter baumanni*.
A. baumannii has been steadily emerging as a poly-resistant organism in burn treatment centers. In addition to the problem of widespread colonization of patient care areas, there has been the progressive development of multiple resistance genes. The goal of this project is to evaluate the microbiological and clinical efficacy of three potential antimicrobial agents over 24-months in

three groups of 20 adult patients with documented *A. baumannii* infections to determine if there are any subtle or frank differences in outcome with the use of these antimicrobials. Using standard manufacturer-recommended doses, we intend to compare two agents that have not been routinely used, colistin and tigacycline, to imipenem-cilistatin to guide best practices in *A. baumannii* treatment. Using standard statistical testing methods the duration of treatment, time to onset of infection, and other parameters will be investigated. Standard assessment of infection response will be used to evaluate and compare these three agents. Pilot data on Crozer burn patients with *A. baumannii* pneumonia will also be analyzed.

BODY:

The approved Statement of Work is as follows:

Study 1, Protocol Title: "Automated Fluid Resuscitation of Burn Patients – Phase 1"

Task 1: To collect data from 20 study subjects which will be used to create an effective resuscitation algorithm for the development of a closed loop resuscitation system.

a. Complete project start-up activities (hiring and training of research staff, purchasing equipment) (Year 1, Quarter 1)
b. Enroll 15 study subjects and collect data (Year 1, Quarters 2-4)
c. Enroll 5 study subjects and collect data (Year 2, Quarter 1)

Study 2, Protocol Title: "Evaluation of Xxx for Autogenous Skin Donor Sites"

Task 1: Enroll up to 30 patients in this multi-center trial to evaluate the performance of the identified dressing versus standard of care dressing (Xeroform) for skin donor sites in terms of day of healing, comfort, cosmetics and ease of use.

a. Complete project start-up activities (hiring and training of research staff) (Year 1, Quarter 1)
b. Enroll 75% of study subjects, harvest subject's donor sites, randomize dressing to donor sites, and conduct clinical assessments (Year 1, Quarter 2-4)
c. Enroll 25% of study subjects, harvest subject's donor sites, randomize dressing to donor sites, and conduct clinical assessments (Year 2, Quarter 1)
d. Summarize results (Year 2, Quarter 1)

Study 3, Protocol Title: "A Comparison of Clinical and Microbiological Efficacy of Three Antibiotic Regimens Against *Acinetobacter baumannii*"

Task 1: To collect data from three groups of 40 patients and to compare the responses to antibiotic therapy with specific focus on: 1) differences in duration of therapy; 2) differences in time to eradication of infection (laboratory findings changes, vital signs, culture results); 3) differences in adverse reaction profiles of the patients; and 4) impact on the susceptibility of *A. baumannii* to these agents over a two year period.

a. Complete project start-up activities (hiring and training research staff) (year 1, quarter 1)
b. Enroll 45 subjects and collect data (year 1, quarters 2-4)
c. Enroll 15 subjects and collect data (year 2, quarters 1)
d. Enroll 60 additional subjects (year 2, quarters 2-4, Year 3, quarter 1)
e. Compose report, submit abstract for national meeting presentation, write manuscript for publication (year 4, quarter 2)

(Note: 'd' and 'e' will extend beyond the grant period. See Proposal Narrative)

Discussion

Study 1 (Resuscitation Study): The CRADA required to move forward with this study was finalized on October 14, 2009, allowing for purchase of the clinical equipment required for the project to move forward. These purchases were finalized in the last quarter of this period. A site visit with representatives of the Army Burn Center is the final step required to commence this study. A visit was scheduled for June 2, 2010 and July 1, 2010, but unfortunately needed to be cancelled by the Army. We are attempting to reschedule this visit.

Study 2 (Donor Site Study): Enrollment of patients into this study began in the prior year (April, 2009). A total of 303 patients have been screened for eligibility, 16 patients were identified as meeting the study criteria. As of the end of this period (July, 2010), a total of ten (10) patients have completed the study. The Research Nurse makes daily rounds on the burn unit to identify possible candidates for the study. Due to the limits of the eligibility criteria, enrollment has been difficult. A summary of patients screened and entering the study is shown in the table below.

Research Monthly Summary, FY 2009-2010
Donor Site Study –AcquaCel AG

	JAN	FEB.	MAR.	APR.	MAY	JUN	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL
2009													
# PATIENTS SCREENED						16	16	18	16	25	25	21	137
# MEETING CRITERIA				1	1	1	1	1	2	0	0	0	7
# EXCLUDED						15	15	17	15+1* size	25	25	21	118
# IN STUDY			1	2	1	0	1	2	1	0	0	0	
# COMPLETING STUDY				1	1	0	0	1	1	0	0	0	4
# DECLINED						1	0	0	0	0	0	0	1
2010													
# PATIENTS SCREENED	15	27	21	27	30	46	46	34					246
# MEETING CRITERIA	2	2	3	0	0	0	2	0					9
# EXCLUDED	13	25	18	27	30	46	44	34					237
# IN STUDY	2	4	3	2	0	0	1	1					
# COMPLETING STUDY	0	2	1	2	0	0	0	1					6
# DECLINED	0	0	2	0	0	0	1	0					3

Study 3: Study 3, a project defined by Crozer, has not begun because Crozer has not had any patients that met the criteria for inclusion since April, 2008.

The narrative below summarizes the project activities for each month of the project year, as documented in the project's quarterly reports:

July 2009 – Sept 2009:
Study #2 – Donor Site Study continues. The Burn Research Nurse completes daily rounds to identify patients for the donor site study. Weekly Research Meetings continue with the team to ensure IRB dates remain active and current.

Study #1 – Resuscitation Study Status: CRADA/SoW signed by both parties. Awaiting USAISR response to the procurement of the DAQ machine and to arrange for a site visit. Once site visit in imminent, clinical equipment will be purchased and computer room set-up for the start of the study.

Oct 2009 – Dec 2009:
Study #2 – Donor Site Study continues. The Burn Research Nurse completes daily rounds to identify patients for the donor site study. Weekly Research Meetings continue with the team to ensure IRB dates remain active and current.

Study #1 – Resuscitation Study Status: Awaiting USAISR response to the procurement of the DAQ machine and to arrange for a site visit. Once site visit in imminent, clinical equipment will be purchased and computer room set-up for the start of the study.

Jan 2010 – Mar 2010:
Study #2 – Donor Site Study continues. The Burn Research Nurse completes daily rounds to identify patients for the donor site study. Weekly Research Meetings continue with the team to ensure IRB dates remain active and current.

Study #1 – Resuscitation Study Status: Awaiting USAISR response to the procurement of the DAQ machine and to arrange for a site visit. Once site visit in imminent, clinical equipment will be purchased and computer room set-up for the start of the study.

Apr 2010 – June 2010:
Study #2 – Donor Site Study continues. Patient #9 has been completed. The Burn Research Nurse completes daily rounds to identify patients for the donor site study. Weekly Research Meetings continue with the team to ensure IRB dates remain active and current.

Study #1 – Resuscitation Study Status: Clinical equipment has been purchased and delivered. The DAQ machine is now a laptop computer and we are in the procurement process of two additional laptops to covert to a DAQ computer. The date for site visit had been arranged— June 2, 2010. This visit was cancelled at the last minute by the USAISR representatives due to vacations of the engineers at Crozer. We have arranged a site visit for July 1, 2010.

KEY RESEARCH ACCOMPLISHMENTS:

Study 2 has been enrolling patients. It is hoped that Study 1 will commence by November 1, 2010.

REPORTABLE OUTCOMES:

There are no outcomes to report. However, one of the studies has been enrolling patients.

CONCLUSION:

Conclusions will be drawn at the completion of the research projects.

REFERENCES:

No publications have been completed.

APPENDICES:

Not applicable.